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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/641,831	08/18/2000	C. Alexander Turner JR.	LEX-0035-USA	6428

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EXAMINER	
MYERS, CARLA J	
ART UNIT	**PAPER NUMBER**
1634	

DATE MAILED: 05/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/641,831	TURNER ET AL.	
	Examiner	Art Unit	
	Carla Myers	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 February 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the amendment filed February 20, 2004. Applicants arguments have been fully considered but are not persuasive to overcome the present grounds of rejection. This action is made final.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The pending claims have been reviewed in light of the Utility Examination Guidelines and Guidelines for Examination of Patent Applications under 35 U.S.C. 112, first paragraph, "Written Description" Requirement, Federal Register, Vol. 66, No. 4, pages 1092-1111, Friday, January 5, 2001.

The examiner is using the following definitions in evaluating the claims for utility.

"Specific" - A utility that is *specific* to the subject matter claimed. This contrasts with a *general* utility that would be applicable to the broad class of the invention.

"Substantial" - A utility that defines a "real world" use. Utilities that require or constitute carrying out further research to identify or reasonably confirm a "real world" context of use are not substantial utilities.

"Credible" - Credibility is assessed from the perspective of one of ordinary skill in the art in view of the disclosure and any other evidence of record that is

probative of the applicant's assertions. That is, the assertion is an inherently unbelievable undertaking or involves implausible scientific principles.

"Well-established" - a specific, substantial, and credible utility which is well known, immediately apparent, or implied by the specification's disclosure of the properties of a material, alone or taken with the knowledge of one skilled in the art.

3. Claims 1-12 are rejected under 35 U.S.C. 101 because the claimed invention lacks a credible, substantial, specific or well-established utility.

The claims are drawn to isolated nucleic acids comprising the sequence of SEQ ID NO: 1, 3, or 5 and nucleic acids encoding the amino acid sequence of SEQ ID NO: 2, 4 or 6. The specification refers to these nucleic acids as encoding NHPs (novel human proteins). The claimed polynucleotides are not supported by either a specific and substantial asserted utility or a well-established utility. The specification fails to provide objective evidence of any activity for the encoded polypeptides. Rather, the specification indicates that homology studies show that the putative proteins have identity with "a variety of putative secreted proteins, a tyrosine phosphatase, several human LIM proteins, as well as several cancer (colon, renal, and lung) associated antigens" (page 12). It is further stated that the NHPs "share structural motifs typical of the human APXL protein- a protein that is similar to a Xenopus amiloride sensitive sodium channel" (page 2). While the specification states that the sequences of the polynucleotides have homology to other known proteins, the specification does not set forth a specific level of sequence identity shared, over the complete

sequence, between the claimed polynucleotides and known polynucleotides encoding transporter proteins. Identity of a polynucleotide sequence to other known polynucleotides does not by itself establish that a polynucleotide will encode for a product having the same activity as the known polynucleotides because a change at even a single amino acid position may affect a proteins function and a change at a single nucleotide position may affect the ability of a polynucleotide to encode for a polypeptide. Furthermore, no information is provided regarding the conservation of any particular domains which are required for transporter function or which are characteristic of specific types of transporter proteins. Accordingly, there is no evidence of record to suggest that the claimed polynucleotides do in fact encode for polypeptides a particular activity. In addition, the specification does not distinguish between which polynucleotides have identity to APXL, which have identity to "secreted proteins", which have identity to a tyrosine phosphatase, which have identity to a LIM protein, and which have identity to a cancer antigen. Moreover, these types of proteins fall into very general classes of proteins and are not considered to constitute a specific activity for utility purposes. The specification (for example, 12) suggests that the claimed polynucleotides could be used for therapeutic purposes or for diagnosis of disease. However, no specific diseases have been identified which are correlated with expression of the claimed polynucleotides. Clearly, further research would be required to identify a disease for which the encoded protein is involved and for which treatment with the encoded proteins would be effective or for which detection of expression of SEQ ID NO: 1, 3 or 5 would be informative.

As stated in Brunner v. Manson, 383 U.S. 519 535-536, 148 USPO 689, 696 (1966) " a patent is not a hunting license. It is not a reward for the search, but compensation for its successful conclusion". The specification (see, for example, pages 30, 35 and 38) further asserts that the polynucleotides of SEQ ID NO: 1, 3 and 5 and the proteins of SEQ ID NO: 2, 4 and 6 can be used in drug screening methods. However, because the specification has not established that the proteins of SEQ ID NO: 2, 4 and 6 have a functional activity, the general concept of using any compound for the purposes of screening for agents which bind this compound is not considered to be a specific utility. While nucleic acids comprising SEQ ID NO: 1, 3 and 5 could be expressed to obtain protein for use in research aimed at determining or characterizing the polypeptides function, such use is general, rather than specific and substantial. Support for an asserted utility that is specific and substantial would require, for example, a showing of a particular function for an encoded polypeptide. Merely identifying and studying the properties of a polypeptide or the diseases in which a polypeptide may be involved does not constitute a "real world" context of use. Accordingly, the claimed invention is not supported by either a specific or substantial asserted utility or a well-established utility. Applicant is directed to the Utility Examination Guidelines, Federal Register, Vol. 66, No. 4, pages 1092-1099, Friday January 5, 2001.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any

> person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-12 are rejected under 35 U.S.C. 112, first paragraph.

Specifically, since the claimed invention is not supported by either a specific and substantial, or credible asserted utility or well-established utility for the reasons set forth above, one skilled in the art would not know how to use the claimed invention.

RESPONSE TO ARGUMENTS

5. In the response filed February 20, 2004, Applicants assert that SEQ ID NO: 1 and "fragments presented in SEQ ID NO: 3 and 5" encode novel human channel proteins. However, human channel proteins constitute a large, general class of proteins. Channel proteins include, for example, potassium channel proteins, sodium channel proteins, calcium channel proteins, chloride channel proteins and water channel proteins. Knowledge that a nucleic acid potentially encodes for a protein that shares identity with a channel protein does not provide an adequate teaching of how to use such a nucleic acid since each different type of channel protein functions in a distinct manner. Accordingly, Applicant's assertion that SEQ ID NO: 1 encodes for a channel protein does not constitute a specific utility for the claimed invention. Further, Applicants have not clarified how the fragments of SEQ ID NO: 3 and 5 also encode for channel proteins. There are no teachings in the specification as to which regions of the protein are critical for activity and no clear teachings that the fragments of SEQ I D NO: 3 and 5 will encode for proteins that are capable of functioning as specific channel proteins.

Applicants state that APX is known to be an apical plasma membrane protein that plays a role in the functional expression of the amiloride-sensitive sodium channel in Xenopus laevis. Applicants assert that "as explicitly noted in the present specification (on page 2 lines 2-4), the protein encoded by the sequences of the present invention and APXL share a PDZ domain (Exhibit D)." However, in fact page 2 of the specification states that the proteins "described for the first time herein share structural motifs typical of the human APXL protein – a protein that is similar to a Xenopus amiloride sensitive sodium channel." The specification does not explicitly describe the protein as including a PDZ domain that is present in both human APXL and the APX protein of Xenopus. Exhibit D provided in the response of February 20, 2004 shows a printout of the "NCBI Conserved Domain Summary" for a query of apical protein xenopus-like protein. The printout shows the presence of a PDZ domain. However, exhibit D does not appear to show an analysis of the PDZ domain in the presently claimed protein sequences encoded by SEQ ID NO: 1, 3 and 5. The response and the exhibit do not provide any information regarding the degree of identity shared between the PDZ domains of the proteins encoded by SEQ ID NO: 1, 3 and 5 and the proteins APX and APXL. Applicants argue that PDZ domains "are typically present in cytoplasmic proteins where they bind either the carboxyl-terminal sequences of proteins or internal peptide sequences that are involved in forming macromolecular channel complexes." Thereby, Applicants assert that they have established that the presence of the PDZ domain indicates that the presently claimed proteins are channel proteins and that these proteins have utility.

However, as stated above, channel proteins are a general class of proteins. This utility is not considered to be a specific and substantial utility because knowledge that a protein is a channel protein does not explicitly teach one how to use such a protein. Further research would be required to determine what type of channel proteins are encoded by SEQ ID NO: 1, 3 and 5 and to determine how to specifically use the channel proteins. Applicants statements emphasize the uncertainty in determining the functional properties of the proteins. It is stated that the PDZ domain is "typically present in cytoplasmic proteins." Cytoplasmic proteins are an extremely large class of proteins, having diverse functions. The presence of a domain that is typically present in cytoplasmic proteins, and also present in other proteins does not impart a specific utility to a protein. The response states that proteins with PDZ domains bind carboxyl terminal sequences of proteins or internal peptide sequences involved in forming macromolecular channel complexes. Applicants have not taught which carboxy terminal sequences or internal peptide sequences proteins SEQ ID NO: 2, 4 and 6 bind and thereby have not taught a specific use for these proteins. Further, it is maintained that Applicants have not established that the presence of the PDZ domain alone allows one to determine that a protein is a channel protein and that the protein has a specific functional activity.

Additionally, the utility of the claimed nucleic acids must be set forth in the originally filed specification. The specification (page 2) as originally filed states that the proteins described therein "share structural motifs typical of the human APXL protein - a protein that is similar to a Xenopus amiloride sensitive sodium

channel." The specification does not assert that the claimed nucleic acids encode for proteins having the general property of being "channel proteins." The teachings in the specification would indicate at most that the proteins share structural identity with human APXL or with a Xenopus amiloride sensitive sodium channel protein. These teachings do not provide support for the presently asserted utility that the proteins are one of any possible type of channel protein.

Applicants further argue that because the described sequences are expressed in human liver, mammary gland, salivary gland and lung carcinoma cells, the sequences can be used in a gene chip format. These arguments have been fully considered but are not persuasive because while a gene chip itself has utility, uncharacterized gene sequences and fragments thereof do not have a well known established or specific and substantial utility. Gene sequences and fragments thereof may be used in gene-chip and non-gene chip formats to further study the function of nucleic acids. However, studying the expression pattern of uncharacterized nucleic acids and identifying nucleic acids which hybridize to uncharacterized genes constitutes further research to try to determine the biological properties or functional activities of a nucleic acid. The use of a nucleic acid for further research is not considered to be a "real world" utility. Applicants point to several patents to gene chips and state that since DNA chips have utility, compositions which enhance DNA chips should also be considered to be useful. However, again, while claims may be issued to novel gene chips in general and to gene chips having nucleic acids attached thereto wherein the nucleic acids have a specific and well characterized function, the

general concept of attaching a gene of unknown function to a gene chip does not provide a specific and substantial utility. Attachment of nucleic acids lacking a specific and substantial utility to a gene chip does not impart a specific and substantial utility to the nucleic acids.

Applicants state that numerous patents have issued over the years that do not comply with the current utility requirements. It is stated that "the Board is invited to review U. S. Patents ..." Applicants note that one of these patents does not include a working example. It is also stated that "holding Appellants to a different standard of utility would be arbitrary and capricious." These arguments have been fully considered but are not persuasive. It is first noted that this application is not currently in front of the Board. Secondly, the presence of working examples is not required to establish utility. Thirdly, it is not appropriate for applicants to review patented claims and make assertions regarding the validity of these claims, with or without knowledge of the patent prosecution history. The present claims have been examined on their own merits based upon the present Utility Guidelines. For the reasons set forth above, Applicants have not established a specific and substantial utility for the claimed invention, nor have Applicants provided a utility for the claimed invention that is consistent with the utility asserted in the specification as originally filed. Accordingly, it is maintained that the claimed invention is not supported by a specific and substantial or well-established utility.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carla Myers whose telephone number is (571) 272-0747. The examiner can normally be reached on Monday-Thursday from 6:30 AM-5:00 PM. A message may be left on the examiner's voice mail service. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion, can be reached on (571)-272-0782.

Papers related to this application may be faxed to Group 1634 via the PTO Fax Center using the fax number (703)-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Carla Myers
May 5, 2004

CARLA J. MYERS
PRIMARY EXAMINER